



Course Specifications

Course Title:	Chemistry of Aromatic Compounds
Course Code:	4022142-3
Program:	Pure Chemistry
Department:	Chemistry
College:	Applied Science
Institution:	Umm Al-Qura University

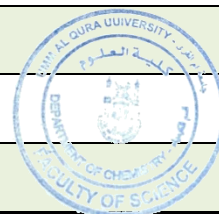


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A. Course Identification

1. Credit hours: 3
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 4 st level / 2 th year
4. Pre-requisites for this course (if any): Chemistry of Aliphatic Compounds (4022132-3)
5. Co-requisites for this course (if any): not applicable

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	45
3	Tutorial	--
4	Others (quizzes and exams)	6
	Total	81
Other Learning Hours*		
1	Study	45
2	Assignments	10
3	Library	6
4	Projects/Research Essays/Theses	4
5	Others (quizzes and exam preparation)	16
	Total	81

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Course include definition of aromaticity, methods of nomenclature, chemical properties and synthesis as well as some physical properties of all families of aromatic compounds.

2. Course Main Objective

By the end of this course student will be familiar with basic concepts in aromatic chemistry including dividing, naming, preparation, physical and chemical properties.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Define aromatic compounds and aromaticity	K1, K3
1.2	Name different organic classes using common and IUPAC system	K1
1.3	Classify different aromatic families	K3
1.4	Describe the different methods of preparations of aromatic compounds	K4
1.5	Familiar with the physical properties of different aromatic compounds and their relation with the structure	K3
1.6	Select the proper method of conversions among different aromatic compounds	K4
1.7	Recognize the chemical properties of aromatic compounds	K5
1.8	Write a mechanism of electrophilic aromatic substitution reactions.	K2, K4
1.9	Explain the products of different aromatic reactions	K3
2	Skills:	
2.1	Choose the suitable method for the preparation of aromatic compounds	S4
2.2	Apply the IUPAC rules for all aromatic families	S1
2.3	Choose the suitable mechanism for some organic reactions	S1, S4
2.4	Explain the different strategies for preparation of aromatic compounds	S3
2.5	Analyze the reasons for the unique physical properties in some aromatic compounds	S1
2.6	Predict the expected product in different aromatic reactions according to the functional group	S2
2.7	Summarize the different reactions of aromatic compounds	S4

CLOs		Aligned PLOs
2.8	Able to work individually and in a team to perform a specific experimental tasks.	S6, S8
3	Competence:	
3.1	Enhance the ability to use computers and internet	C3, C4
3.2	Present chemical data orally.	C1
3.3	Apply his knowledge to write a chemical report	C1, C2, C3
3.4	Able to share results to classmate and participation in class or laboratory discussions	C1, C2

C. Course Content

No	List of Topics	Contact Hours
1	Aromaticity: Huckelrule and annulenes. Benzene: molecular orbital theory point of view, stability and resonance	2
2	Chemical properties of benzene: friedel-crafts reactions and their applications in organic syntheses	2
3	Electrophilic substitution reactions	4
4	Reactivity and orientation in benzene ring – second electrophilic substitution	4
5	Reactivity and orientation in benzene alkyl derivatives	4
6	Aromatic amines and their derivatives.	2
7	Sulfonic acids and their derivatives.	2
8	Phenols and their derivatives.	2
9	Aromatic aldehydes and ketones.	2
10	Aromatic carboxylic acids and their derivatives.	2
11	Poly nuclear aromatic hydrocarbons – diphenyl benzedine derivatives.	2
12	Condensed aromatic hydrocarbons - Cancer-causing hydrocarbon.	2
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Define aromatic compounds and aromaticity	Lectures	Quiz. Final exam.
1.2	Name different organic classes using common and IUPAC system	Lectures. Web based study. Library visit.	Quiz. Final exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.3	classify different aromatic families	Lectures. Lab work.	Quiz. Lab exam.
1.4	Describe the different methods of preparations of aromatic compounds	Lectures.	Quiz. Final exam.
1.5	Familiar with the physical properties of different aromatic compounds and their relation with the structure	Lectures. Library visit.	Quiz. Final exam.
1.6	Select the proper method of conversions among different aromatic compounds	Lectures.	Final exam.
1.7	Recognize the chemical properties of aromatic compounds	Lectures.	Quiz. Final exam.
1.8	Write a mechanism of electrophilic aromatic substitution reactions.	Lectures. Web based study. Library visit.	Final exam
1.9	Explain the products of different aromatic reactions	Lectures. Web based study. Library visit.	Final exam. Lab report
2.0	Skills		
2.1	Choose the suitable method for the preparation of aromatic compounds	Lectures. Lab work.	Lab report. Lab exam.
2.2	Apply the IUPAC rules for all aromatic families	Lectures.	Final exam.
2.3	Choose the suitable mechanism for some organic reactions	Lectures.	Final exam.
2.4	Explain the different strategies for preparation of aromatic compounds	Lectures.	Final exam.
2.5	Analyze the reasons for the unique physical properties in some aromatic compounds	Lectures. Lab work.	Final exam. Lab exam.
2.6	Predict the expected product in different aromatic reactions according to the functional group	Lab work. Lectures.	Lab exam. Final exam.
2.7	Summarize the different reactions of aromatic compounds	Lab work. Lectures.	Lab exam. Final exam.
2.8	Able to work individually and in a team to perform a specific experimental tasks.	Lab work	Lab exam
3.0	Competence		
3.1	Enhance the ability to use computers and internet	Research activity. Web based study.	Portfolios
3.2	Present chemical data orally.	Class discussion.	Class discussion

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.3	Apply his knowledge to write a chemical report	Research activity.	Portfolios
3.4	Able to share results to classmate and participation in class or laboratory discussions	Class discussion.	Class discussion

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-term exam	8-10	20%
2	Assignments and activities		5%
	Quizzes and class discussions		5%
3	Practical Exam	15	30%
4	Final Exam.(2 hours exam)	16	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- We have faculty members to provide counseling and advice.
- Office hours: During the working hours weekly.
- Academic Advising for students (about 20-25 student/ one faculty member).

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	John McMurry's " <i>Organic Chemistry, 8th edition, International Edition</i> " 2011, Brooks/Cole.
Essential References Materials	<ol style="list-style-type: none"> 1. Amit Arora "<i>Introductory Organic Chemistry</i>" 2006, Discovery Publishing House New Delhi 2. John McMurry's "<i>Organic Chemistry, 8th edition, International Edition</i>" 2011, Brooks/Cole 3. T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "<i>Organic Chemistry, 11th Edition, International Student Version</i>" 2013, John Wiley & Sons.
Electronic Materials	<ul style="list-style-type: none"> • Lecture Hand-out available as a PowerPoint presentation. • http://www.chemweb.com • http://www.sciencedirect.com • http://www.rsc.org
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> Classrooms capacity (30) students. Providing teaching halls including computers and projector.
Technology Resources (AV, data show, Smart Board, software, etc.)	Teaching halls equipped with computer and data show.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	No other requirements.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Program leader	Direct
Extent of achievement of CLO's	Peer Reviewer	Direct
Quality of learning resources	Students and Faculty members	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	

Received by: Dr. Ismail Althagafi

Department Head

Signature:



Date: 20/12/2019

